

## Research Associate

### Sustainable Food Manufacturing

REQ200092

**As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.**

#### Centre for Sustainable Manufacturing and Recycling Technologies (SMART)

The Centre for SMART was established in the Wolfson School of Mechanical, Electrical and Manufacturing Engineering at Loughborough University to provide synergy for the growing teaching and research activities in sustainable design and manufacture ([www.lboro.ac.uk/smart](http://www.lboro.ac.uk/smart)). Since its establishment in 2004, the Centre has attracted more than £10 million of national and European research funds to support its activities, and this has supported the successful completion of 25 PhD programmes and the publication of over 150 refereed conference and journal papers. The Centre members have a wide range of expertise and are currently involved in a number of national and European programmes researching the social, economic and environmental aspects of a variety of consumer products and industrial processes. The Centre provides core knowledge and expertise in life cycle analysis, sustainable design, resource efficient manufacturing, eco-intelligent sensing, monitoring and process control, sustainable business and consumption models, and end-of-life processing and recycling technologies.

#### Project Description

Food and drink is the largest manufacturing sector in the UK with a turnover of £76.2bn (20% of all UK sectors), employing up to 400,000 people, and tax/salaries in excess of £10bn. The rapidly increasing world population, changes in dietary behaviours, and loss of arable land linked to climate change, urgently demands a need to change the way we grow, manufacture and consume our food products. The unique attributes of food products such as the need for fresh perishable ingredients, health risks associated with inappropriate production environment, stringent storage and distributions requirements together with short post-production shelf-life makes them considerably different to other manufactured goods.

In this context, one of the most prominent challenges commonly acknowledged by modern food manufacturing companies is 'how to do more with less?' Over the last 6 years, two nationally (EPSRC) funded research projects at the Centre for SMART have investigated key challenges facing modern food manufacturers, including how do we improve the efficiency of food production processes through use of smart technologies to consume fewer resources (energy and water) ? and how do we use material currently discarded as waste as a new source of raw material in food production?

This research has utilised the latest advances in digital technologies, introduced through recent advances in Industry 4.0 and associated concepts in the Internet-of-Things (IoT), to develop prototype tools for real-time, minimally invasive monitoring and analysis tools to support food manufacturing (i.e. post farm-gate to supermarket shelf). This has resulted in four prototype tools that have shown significant potential for improving resource efficiency in food production. The overall objective of this project is to test and validate these prototype digital tools using real data gathered from industrial collaborators, and to analyse this data to improve the resource efficiency of food production systems. This is to be achieved through:

1. Undertaking proof-of-concept experiments related to digital water fingerprinting, energy modelling of food production processes, and digital food waste image processing.
2. Collecting actual industrial data and/or physical samples (wastewater and food) for these experiments from project partners.
3. Developing a 'Resource Dashboard' prototype for demonstration to support future commercialisation.

## Job Description

**Job Grade:** Research Grade 6

### Job Purpose

The post holder will hold a research position within the Centre for SMART and be responsible for undertaking a set of experiments for improving resource efficiency and productivity in food manufacturing. They will contribute to the development of new research themes around the concept of 'Resource Efficient Food Manufacturing' and to the preparation of substantial research and enterprise proposals.

### Job Duties

- To conduct laboratory experiments related to measurement and monitoring of energy and water consumption and food waste generation.
- To collect samples and relevant resource data from production sites of industrial partners in the UK.
- To apply previous knowledge and experience to develop software and hardware solutions for improving resource efficiency in food manufacturing.
- To produce case study reports summarising the results from industrial experimentation.
- To make a significant contribution to research activities in the area of Resource Efficient Food Manufacturing.
- To travel, when required, to UK food manufacturers and equipment suppliers.
- Make presentations to industry and academia.
- Provide support and supervision of research students and associates.
- Deputise for the project leader(s) when required.
- Work as part of a project and university team.
- Work effectively with relevant administrative, technical and academic staff in the School and across the University.
- Engage in training programmes at the University (e.g. through Staff Development) which are consistent with the post holder's needs and aspirations and those of the project team.
- Pursue excellence and maintain high standards of safety in all activities.
- Undertake other such duties as may be reasonably requested, and that are commensurate with the nature and grade of the post.

### Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

### Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

### Organisational Responsibility

Reports to the Professor of Sustainable Engineering.

## Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

### Essential Criteria

Area	Criteria	Stage
Experience	Current or recent relevant work experience in an academic or industrial environment.	1, 3
	Practical experience of conducting laboratory experiments, using digital sensors and meters as well as control and monitoring software systems	1, 3
	Experience of developing software applications for data analysis and user interface	1, 3
	Relevant project management experience	1, 3
	A substantial track record of disseminating research findings to industry and writing technical reports.	1, 3
Skills and abilities	Excellent written and oral communication skills	1, 3
	Excellent interpersonal and organisational skills	3
	Ability to work independently, plan own work and meet deadlines	1, 3
	Good IT and administrative skills	1
	Ability to support research students in relevant areas	1
	Ability to define research proposals and seek industrial support	1, 3
	Excellent knowledge of presentation and report writing software	1, 3
Training	A willingness to undertake further training as appropriate and to adopt new procedures as and when required	3
Qualifications	A good honours degree in Mechanical, Electrical and Electronic Engineering, Food Science and Technology or a relevant engineering discipline	1
	Post-graduate qualification to Doctorate level in a relevant subject area or significant relevant experience at a senior level	1, 3
Other	Commitment to observing the University's Equal Opportunities policy at all times	1
	Willingness and ability to travel	1, 3
	Commitment to maintaining confidentiality at all times	3

### Desirable Criteria

Area	Criteria	Stage
Experience	Experience of working in, or collaborating with, the food industry	1,3
	Experience of presenting technical projects in an academic and industrial environment	1, 3
	A track record in the exploitation of research results	1, 3

	Experience of authoring original work for academic journals with high citation factors, conference papers or technical reports for industry	1, 3
Skills and abilities	Extensive knowledge of food production processes and technologies and/or energy management systems	1, 3
	Extensive knowledge of sustainable manufacturing methods and tools	1, 3
	Working knowledge of manufacturing simulation and energy management packages	1, 3
	Working knowledge of programming languages/packages	1, 3
Qualifications	A higher degree (or equivalent experience) in food manufacturing	1
Other	Valid licence for driving in the UK	1

## Conditions of Service

The position is **full-time** and **fixed-term** until July 2020. Salary will be on Specialist and Supporting Academic Research 6, (£30,942 - £40,322 per annum), at a starting salary to be confirmed on offer of appointment. The appointment will be subject to the University's normal Terms and Conditions of Employment for Grade 6 and above staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html>.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>